DIAGNOSTIC CASE REPORT

U. S. GEOLOGICAL SURVEY-BIOLOGICAL RESOURCES DIVISION
NATIONAL WILDLIFE HEALTH CENTER-HONOLULU FIELD STATION
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Case Number: 21142

Submitter Name:

Mr. John Klavitter
US Fish and Wildlife Service
PO Box 50167
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United States

Species submitted (n):

Dragonfly: Larva (1)
Duck: Laysan (84)
Duck: Northern Pintail (6)
Fish: Mosquito (1)
Midge: Larva (2)

SPECIMENS SUBMITTED: Carcass-Chilled

History: These birds were submitted as part of a die off of Laysan ducks and pintails on Midway Atoll between 10 August, 2008 to 25 October, 2008. Details on the course of the epizootic are available from USFWS/USGS updates. The epizootic proceeded in two waves with one major peak in August involving Laysan ducks and another small peak of mortality in October involving pintail ducks and Laysan ducks. This report summarizes the necropsy findings of this event.

Findings: Eighty four Laysan and 6 pintails were necropsied. Sixty four Laysan ducks came from Sand Island, 17 from Eastern and the remainder from unknown locations; all pintails came from Sand Island. Sex breakdown for Laysan ducks was 34 females, 28 males and 22 unknowns and 4 females and 2 males for pintails. Age breakdown probably needs confirmation from Michelle Reynolds, however, based on our necropsy findings (e.g. stage of maturation of gonads) and plumage, we came up with the following age structure for Laysan ducks: Adults-36, Hatch year-31, Duckling-8, Second year-5 and unknown 4. All pintails appeared to be non breeding adults or immatures. Fifty two Laysan ducks were in good to excellent body condition, 17 were in fair body condition, 7 in poor body condition and the remainder unknown. For pintails, the breakdown for body condition was 1 good, 4 fair and 1 poor. Of 84 Laysan ducks submitted for necropsy, 18 were too decomposed to warrant further examination. Of the remainder, 63 ducks were diagnosed as confirmed (n=10) or suspect botulism cases, one was diagnosed as trauma, and 4 were diagnosed with bacterial lung infection. Common gross lesions in Laysan ducks with botulism were red discoloration of the lungs microscopically confirmed as pulmonary edema. Three Laysan ducks had mild infections with Echinuria. Two laysan ducks submitted were collected in May and June of 2008 but were not part of this epizootic; both died from emaciation either complicated by secondary fungal pneumonia or Echinuria. Diagnosis for all 6 pintails was confirmed (n=3) or suspect botulism. One pintail had nematodes in its gastrointestinal tract. Fish (Gambusia), midges, and dragonfly larvae all tested negative for botulism type C.

Final diagnosis: Accession 1-Botulism type C; Accession 2-Emaciation suspect; Accession 3-Botulism type C; Accession 4-Botulism type C; Accession 5-Botulism type C; Accession 6-Botulism type C; Accession 7-Botulism type C; Accession 8-Botulism type C; Accession 9-Botulism type C; Accession 10-Botulism type C; Accession 11-Botulism type C; Accession 12-Unsuitable for exam; Accession 13-Botulism type C; Accession 14-Unsuitable for exam; Accession 15-Unsuitable for exam; Accession 16-Botulism type C; Accession 17-Unsuitable for exam; Accession 18-Botulism type C; Accession 19-Unsuitable for exam; Accession 20-Botulism type C; Accession 21-Botulism type C; Accession 22-Botulism type C; Accession 23-Unsuitable for exam; Accession 24-Unsuitable for exam; Accession 25-Botulism type C; Accession 26-Botulism type C; Accession 27-Unsuitable for exam;

Accession 28–Unsuitable for exam; Accession 29–Botulism type C; Accession 30–Botulism type C; Accession 31–Emaciation suspect; Accession 32–Unsuitable for exam; Accession 33–Unsuitable for exam; Accession 34–Unsuitable for exam; Accession 35–Unsuitable for exam; Accession 36–Unsuitable for exam; Accession 37–Unsuitable for exam; Accession 38–Unsuitable for exam; Accession 39–Unsuitable for exam; Accession 40–Unsuitable for exam; Accession 41–Botulism type C; Accession 42–Botulism type C; Accession 43–Botulism type C; Accession 44–Botulism type C; Accession 45–Botulism type C; Accession 46–Septicemia suspect; Accession 47–Botulism type C; Accession 48–Botulism type C; Accession 49–Botulism type C; Accession 50–Botulism type C; Accession 51–Botulism type C; Accession 52–Botulism type C; Accession 53–Septicemia suspect; Accession 54–Botulism type C; Accession 55–Botulism type C; Accession 56–Septicemia suspect; Accession 57–Botulism type C; Accession 58–Botulism type C; Accession 59–Botulism type C; Accession 60–Botulism type C; Accession 61–Botulism type C; Accession 62–Botulism type C; Accession 63–Botulism type C; Accession 64–Botulism type C; Accession 65–Botulism type C; Accession 66–Botulism type C; Accession 67–Botulism type C; Accession 68–Botulism type C; Accession 69–Botulism type C; Accession 70–Botulism type C; Accession 71–Botulism type C; Accession 72–Botulism type C; Accession 73–Botulism type C; Accession 74–Botulism type C; Accession 75–Septicemia suspect; Accession 76–Botulism type C; Accession 77–Botulism type C; Accession 78–Botulism type C; Accession 79–Trauma suspect; Accession 80–Botulism type C; Accession 81–Botulism type C; Accession 82–Botulism type C; Accession 83–Botulism type C; Accession 84–Botulism type C; Accession 85–Botulism type C; Accession 86–Botulism type C; Accession 87–Botulism type C; Accession 88–Botulism type C; Accession 89–Botulism type C; Accession 90–Botulism type C; Accession 91–Undetermined; Accession 92–Undetermined; Accession 93–Undetermined; Accession 94–Euthanasia.

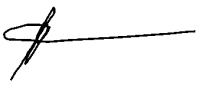
Comments: Laboratory and field observations indicated that the cause of this epizootic was botulism. The lack of significant gross lesions, birds dying in good body condition, and presence of botulism toxin in heart blood confirmed this. The lesions seen in the lungs (bacterial infection) were most likely sequelae to aspiration of water and foreign material in birds poisoned with botulism; pulmonary edema was a common microscopic lesion in ducks during the epizootic. Echinuria is present on Midway. Although few ducks were infected, and the lesions in infected ducks were mild and considered incidental, this parasite has the potential to cause significant pathology in Laysan ducks and should be monitored closely. The source of botulism toxin in ducks could not be determined.

Management: Please see report drafted to USFWS dated 6 September, 2008.

Report Date (mm/dd/yyyy): 12/17/2008 **Necropy report:** Available upon request

Copies of this report sent to:

Dr. Michelle Reynolds (USGS)
Ms. Gina Schultz (USFWS)



If you have questions regarding this case, contact Thierry M.Work MS, DVM, MPVM at 808-792-9520. Include above Case Number. Diagnostic findings may not be used for publication without the pathologist's knowledge and consent.

NOTE: Information in this report supersedes any information from previous reports regarding this case